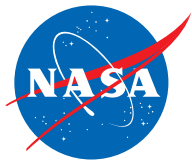


THE INNOVATION CATALYST



August 2022

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TECH TRANSFER TIP

with Administrative
Specialist Scott Leonardi:

DID YOU KNOW THAT EVERY MONTH THE STRATEGIC PARTNERSHIPS OFFICE AND GODDARD'S OFFICE OF GENERAL COUNSEL GET TOGETHER AND HAVE A NEW TECHNOLOGY ASSESSMENT MEETING TO DISCUSS AND ASSESS YOUR NEWLY SUBMITTED TECHNOLOGIES?



»»» UPCOMING EVENTS:



INNOVATOR HOUR
TUESDAY, AUGUST 9, 2022
1:00–2:00 P.M.



Inventor of the Month

Goddard's EHD Modular Pump Cools Things Down

Up in space, it's hard to keep your cool, especially if you're a high-powered electronic device. Much of the electronic hardware found in contemporary satellites and spacecraft generate considerable heat. Goddard-developed instruments in satellites and spacecraft normally function properly at a set operating temperature, which can range from room temperature down to cryogenic temperatures.

"Anything that is consuming power in space to do its job—it could be instruments, the propulsion system or batteries—gets translated into heat," said Luis Santos Soto, chief engineer of Goddard's Small Satellite Project Office. "Those components can get very hot, and all have a certain temperature range to operate. So, if they get too hot, the components will not operate correctly or could even breakdown."

For many years, NASA has been searching for ways to overcome extreme heat to improve the performance and reliability of electronics in its satellites, planetary robots, and manned platforms, including the International Space Station. As with all space hardware, the optimal solution uses little electric power, is lightweight, and has few moving parts, which could create noise and vibrations.



Technologists Jeffrey Didion (center), Matt Showalter (left), and Mario Martins (right)
Photo Credit: NASA

A promising answer to this problem is NASA's electro hydrodynamic (EHD) modular cartridge pump. Designed by Goddard Engineers Jeffrey Didion, Mario Martins,

Matthew Showalter, and Franklin Robinson, the EHD modular cartridge pump uses electric fields to move a dielectric fluid coolant in a thermal loop to dissipate heat generated by electrical components. Aside from being lightweight, the pump consumes very little power to operate and has few key components and no moving parts, which increase its simplicity and robustness.

"The EHD operates no differently than the radiator in your car," explained Jeffrey Didion, senior thermal technologist and manager at Goddard's Mission Support Directorate Nanotechnology Facility. "It's a similar system where you are simply pumping a liquid through the system to control the temperature; the liquid acquires the heat which is then radiated to space at some remote point in the system. So, you go from hot to cold."

Another advantage of the pump is its modular design. That means the various pumping sections that house the high voltage and ground electrodes, along with spacers that act as both an insulator and flow channel for the dielectric fluid, can be easily and simply connected electronically through commercially available pin and jack assemblies.

"So, it is not a mechanical pump that has lifetime issues," said Didion of the EHD technology, which received a

U.S. Patent [# 10,461,621]. "It is easily controlled and can be a smart system, or in other words, how much fluid you pump though the EHD will allow you to maintain the temperature that you want to achieve. Or, you can increase its [cooling] capacity by simply sending it greater voltage. And you don't need a big power system to make it run. That is the idea of this pump."

"I would have to see exactly how much power it uses and how small it is, but the EHD looks like it has a SmallSat application in the future," said Santos Soto. "It's a possibility."

Didion said the team continues to develop the technology from what he terms a "single-phase system to a two-phase system," and is also working on trying to get the EHD pump to a Technology Readiness Level 6, which is a fully functional prototype or representational model.

"We are moving forward with development," Didion said. "We had an initial breakthrough with the cartridge pump in the single-phase system and that was significant. The two-phase system we are working on has the potential to be even more impactful. There is an experiment scheduled at the International Space Station in a couple of years. At that point, the EHD is considered ready for infusion into that project."





Photo Credit: N4 Solutions

SPO a Big Hit at Goldman Sachs 10,000 Small Businesses Summit

There was no baseball played at Nationals Park on July 20, but the Goddard Strategic Partnerships Office (SPO) along with the Office of Small Business Programs (OSBP) swung for the fences and hit a home run at the ballpark with attendees of the Goldman Sachs 10,000 Small Businesses Summit: The Big Power of Small Business. Looking for ways to grow their business, more than 2,500 small business owners from around the U.S. participated in the event, flocked to the SPO booth and discovered ways to engage and partner with Goddard.



Photo Credit: N4 Solutions

"It should come as no surprise that SPO is always on the lookout to engage with industry and partner with other organizations," said Darryl Mitchell, chief of SPO. "One of the interesting things that I

have discovered over the years is, many times, you achieve a great deal of exciting, unexpected accomplishments when you partner with new organizations that you have never partnered with before."

The goal of the three-day summit held July 18-20, 2022, was to bring policymakers, business leaders, entrepreneurs, and small business owners together to share solutions for creating jobs and accelerating an economic recovery. The event took place on day one and two at the Gaylord National Resort and Convention Center at National Harbor, Maryland, followed by a one day (Advocacy Day) event at Nationals Park, Washington, D.C.,—home of the Washington Nationals Major League Baseball team—which prominently featured an exhibit hall on the concourse level with booths from various federal government agencies, including NASA Goddard's SPO, the Department of Defense, the Department of Transportation, and others.

The summit's exhibit hall provided the perfect backdrop for SPO and OSBP representatives to introduce themselves to hundreds of small business owners, learn about their businesses and what problems they are experiencing, and then share with them the kinds of programs Goddard has to offer. Perhaps the most notable aspect of the summit

was the opportunity it provided for Goddard to identify many potential new small business partners.

"It is all about interaction and I wanted them to know Goddard is here to help," stressed Mitchell. "I am aware of the perception that a big federal agency like NASA can be a nightmare to deal with. I wanted to assure them, we're here to help and work with them, so there is no need to be intimidated navigating a large government organization."

"I know the federal government has not been the most user-friendly partner," said U.S. Department of Transportation Secretary Pete Buttigieg at the opening of Advocacy Day at Nationals Park. "But we are working on that."

Attendees visiting the booth were interested to learn that many of the technologies developed at Goddard have received patents and can be easily licensed by interested companies in the public or government sector. So attendees realized, that by not starting from scratch and developing their own technologies, SPO can help connect small businesses with Goddard-developed inventions that could offer a unique niche for small businesses.

"Events like this summit provide small business entrepreneurs with an opportunity to market their capabilities to an audience they may not have thought a partnership or opportunity could exist before," said Jennifer Perez, lead small business

specialist at Goddard. "OSBP uses events like this to find small businesses to add to Goddard's industrial partnership base."

Chetan Karani, co-founder and vice president of Chantilly, Virginia-based Nimble Hub, LLC, was one of many visitors to the Goddard booth. Nimble Hub is a radio frequency identification (RFID) and Internet of Things (IoT) solutions provider to dozens of businesses across the U.S. that is looking for ways to reduce costs.

"We have a number of RFID and IoT products that require laboratory services like temperature cycling and things like that and I did not realize that NASA Goddard could provide those same lab services at a much lower cost," explained Karani. "That is very important to us, because as a small company we typically have to go to a laboratory for environmental testing and obviously, we pay high market fees for those services. Talking to the folks at the NASA Goddard booth, we can get those services at cost, which is very beneficial to a small business like ours."

AT6 (previously Envistacom, LLC) is a technology company that provides tactical satellite communications, cyber intelligence operations, and support services to the Department of Defense (DoD) and coalition partners. Through Sandia National Laboratories, the Duluth, Georgia-based company has launched several DoD satellites from Wallops.



Photo Credit: N4 Solutions



Photo Credit: N4 Solutions

"We are looking to see if there is any other federal government interest outside of the DoD for our antenna technology," said former U.S. Navy Rear Admiral (ret.) and U.S. Navy Senior Technologist Scott Sanders, who presently serves as senior vice president of special projects at the Hollywood and Fredrick, Maryland, branches of AT6. "There absolutely is some potential for partnering with NASA Goddard."

Wen Kusters-Quin, owner/operator of the Houston, Texas-based JuiceWell, which produces and sells plant-based juices, smoothies, lemonades, mylk (not milk), and other drinks, was surprised to learn what Goddard technologies and partnerships had to offer a small beverage business like his. He thought Goddard only offered technologies and partnership opportunities to space-related activities.



Photo Credit: N4 Solutions

To define a small business agenda, summit participants heard from array of distinguished industry leaders about optimizing business growth, including job creation, access to capital, investment, leadership, government contracting, and workforce competitiveness. Along with Buttigieg, among the many featured speakers at Advocacy Day were Senators Ben Cardin [D-MD] and Marco Rubio [R-FL]. Event attendees also heard from producer, screenwriter, actor and small business entrepreneur Ryan Reynolds, the owner of Mint Mobile, and actress Gwyneth Paltrow, founder and CEO of Goop.

"I was just window shopping," confessed Koster-Quin after visiting the Goddard booth. "And I wondered, what does NASA Goddard have to do with small business? But the folks at the booth basically explained to me that scientists invent many technologies and not all of them go into space but can be developed for other uses here on Earth. I learned astronauts had to have food in space, so what technologies did they use to carry, store, and drink in space? For us, maybe there are technologies to help increase shelf life or keep juice cold that could be of benefit. So, yes, we are absolutely going to take a look at Goddard technologies and look and see if any of them can support us in the food and beverage business."



Photo Credit: N4 Solutions

THE STRATEGIC PARTNERSHIPS OFFICE PRESENTS

INNOVATOR HOUR

Have questions about protecting your innovation?

Want to learn more about how to submit New Technology Reports?

Have general questions about technology transfer and partnerships?

SPO can help!

Sign up for a one-on-one 20-minute timeslot with a SPO representative.

Meetings will be held virtually via Microsoft Teams

NEXT SESSION: **TUESDAY, AUGUST 9, 2022**
1:00-2:00 P.M.

Available Timeslots

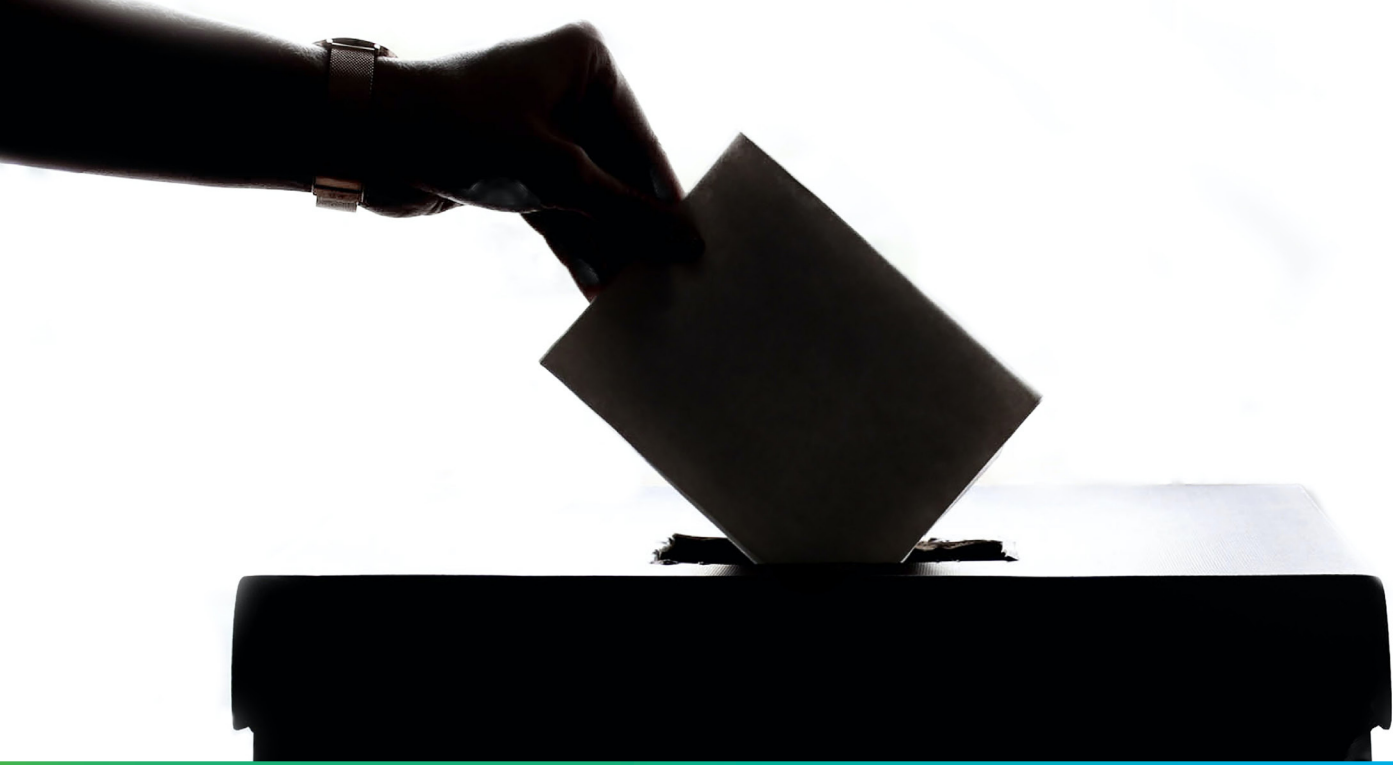
1:00-1:20 P.M.

1:20-1:40 P.M.

1:40-2:00 P.M.

How to Sign Up

To register for the upcoming session and secure your timeslot,
[complete the registration form.](#)



Agency-Level Award Nomination Process Explained

During calls for nominations, Goddard is very excited to put forth inventors and their technology and/or software for the prestigious NASA Invention of the Year (IOYA) and Software of Year (SOYA) awards. These awards recognize the best innovations developed by a NASA individual or team. Out of all the technologies and software Goddard produces, individuals nominated for these awards are recognized as the *creme de la creme* in their field and clearly illustrate to NASA what Goddard inventors can develop.

NASA supports the development of valuable technological innovations. The IOYA recognizes scientists, engineers, and inventions that have significantly contributed to NASA programs, or that exemplify NASA's mission to transfer innovative technology to U.S. industry. SOYA recognizes NASA developers and NASA-developed software that has significantly enhanced the agency's mission to be at the forefront of space exploration and science. Have you ever wondered what the nomination process is like and what the benefits are?

"Once we receive the Agency's call for nominations for a particular award," explained Samantha Kilgore, technology liaison at SPO and Goddard awards liaison officer (ALO), "I then coordinate with our center to determine if we have viable candidates based on the award criteria."

Kilgore then forms a committee that is made up of subject matter experts from each directorate on center. The role of the committee is to review nominations and make sure that the best candidate or candidates are put forward as Goddard's nominee.

"We also distribute award criteria [to each directorate] and encourage them to submit technology nominees," Kilgore added. "We rely very heavily on the SPO Technology Transfer Office to provide viable candidates from within their portfolios. Our technology managers have been involved from the moment of disclosure for most of the technology being nominated and offer very valuable insight into identifying potential candidates."

Once the committee determines there is a candidate or candidates that is a “good fit” to meet all the criteria for the award, Kilgore then reaches out to the nominee, usually the lead inventor of the technology or software. Kilgore then explains the award nomination process, and formally requests the inventor’s commitment for the nomination process.

“Because it requires a certain level of effort from the inventor, it is important to get their support,” notes Kilgore. “We rely on them to provide the committee with an entire package of information [on the technology or software], in addition to presenting in front of the NASA Inventions and Contributions Board (ICB). The presentation is the final step of the nomination process that weighs heavily on the award determination.”

To do that, Kilgore prepares the inventor for what is expected at the ICB presentation. Kilgore also schedules dry run presentations with the inventor and the committee, prepares the final package, and submits it to the ICB for consideration.

Each year, the ICB awards approximately 3,000 individuals with cash awards and recognition. Aside from receiving a monetary reward—in an amount determined by on the number of nominations received and number of awards given—the inventor will also receive a number of other benefits.

“We believe being nominated as Goddard’s nominee for Agency level awards is a way to celebrate and highlight Goddard’s technologies and our amazingly talented inventors,” said Kilgore. “We then look for agency-level opportunities to do things like post on social media, highlight in newsletters across the center, and conduct Agency level webinars, where we reach hundreds of industries to highlight their technologies and how they can benefit society.”

“From the very beginning, the really nice thing about the award process was working with Sam and Dennis [Small] at the Technology Transfer Office,” said Jeffrey Didion, senior thermal technologist and manager of Goddard’s Mechanical Systems Division MSD Nanotechnology Facility, whose electro

hydraulic modular cartridge pump was nominated this year for IOYA. “It seems to me that is the way the process should work, and people should take advantage of it.”

NASA’s Office of the General Counsel sponsors the IOYA. The offices of the Chief Engineer, Safety and Mission Assurance, and Chief Information Officer sponsors the SOYA. The NASA Office of the General Counsel with support from the agency’s Office of the Chief Technologist manages the ICB.

A New Moon Tree Grows at Goddard

Last month, *The Innovation Catalyst* shared with you the story of the Goddard Moon Tree, which was planted from seeds that traveled around the Moon on the Apollo 14 mission in 1971. Pictured is a second-generation Moon Tree living in front of the Goddard Library at Building 21. In honor of Apollo 14’s 50th anniversary last year, the tree was planted from seeds discovered from under the original Goddard Moon Tree at the Visitors Center by Goddard Archivist Christine Lane.



Photo Credit: N4 Solutions



Photo Credit: N4 Solutions

'Mighty' Goddard Information and Collaboration Center Recognized as Federal Library/Information Center of the Year

The Federal Library and Information Network (FEDLINK) bestowed the Goddard Information and Collaboration Center with the 2021 Federal Library/Information Center of the Year recognition. This was the third time since 2006 the Center was recognized by FEDLINK with its prestigious federal library community award for excellence. The award is presented annually to "recognize the many innovative ways that federal libraries, librarians, and library technicians fulfill the information demands of the government, business, scholarly communities, and the American public."

In 2006, the Center won the FEDLINK Center of Year award for having 80 percent of resources digital and for developing a website, which was innovative for federal libraries at that time. The Center won the award again in 2016 for the remodeling of its downstairs space to include meeting and conference room space.

"I was very surprised and excited to win the award this year," said Robin Miller Dixon, branch head and supervisory librarian of the Goddard Information and Collaboration Center. "As librarians, we always want to provide the best service that we can for our customers, and here, we go above and beyond. I feel

what this award represents to our library and our staff is we always do make sure that researchers have what they need and make it easier for people to do research, especially when the building was closed during the pandemic."

FEDLINK bestowed the Center with the award this year [the 2021 award in 2022] for several reasons. Topping the list was for providing "innovative services" during the pandemic by creating a system whereby individuals could safely receive access to book requests and do research even though the building was closed.



Photo Credit: N4 Solutions

"Approximately 99 percent of what we provide is electronic," said Dixon. "But we do have this collection of very valuable books and resources. [Due to the pandemic] only one person was working in the building at a time, or you could come in by appointment. So, we came up with a plan where if a book was not available electronically, then we would have some [member of the staff] come in and pull the book from the shelf and check it out to the person who wanted it. We would then meet them in the circle in front of the library in their car and hand it off to them. That way they never had to come into the library, only the librarian came in."

The Center also received the award for launching new bibliographic and data visualization services. In addition, the Center formed a partnership with the NASA mission directorates to migrate its consortium catalogs and update its knowledge management database.

"Our partnership with the NASA mission directorate was to provide citation analysis related to NASA publications in certain journals," said Dixon. "We worked with the NASA Library Network to migrate our online library catalog into a NASA consortium catalog. The result is that there is now one unified online catalog of the books and journal titles owned by NASA. This facilitates lending of materials between researchers at different centers."



Photo Credit: N4 Solutions

FEDLINK also recognized the Center for working with Dr. Moses Adoko, the Chief Knowledge Officer, to develop what has become known as the Goddard Knowledge Exchange. The purpose of the exchange was to place all of Goddard's engineering knowledge on the library's host server, so it would be stored in one easily accessible place. As part of the Knowledge Exchange Program, the award acknowledged the Center's mapping of the policies for developing an integrated library system to enhance the Center's online public access catalog.



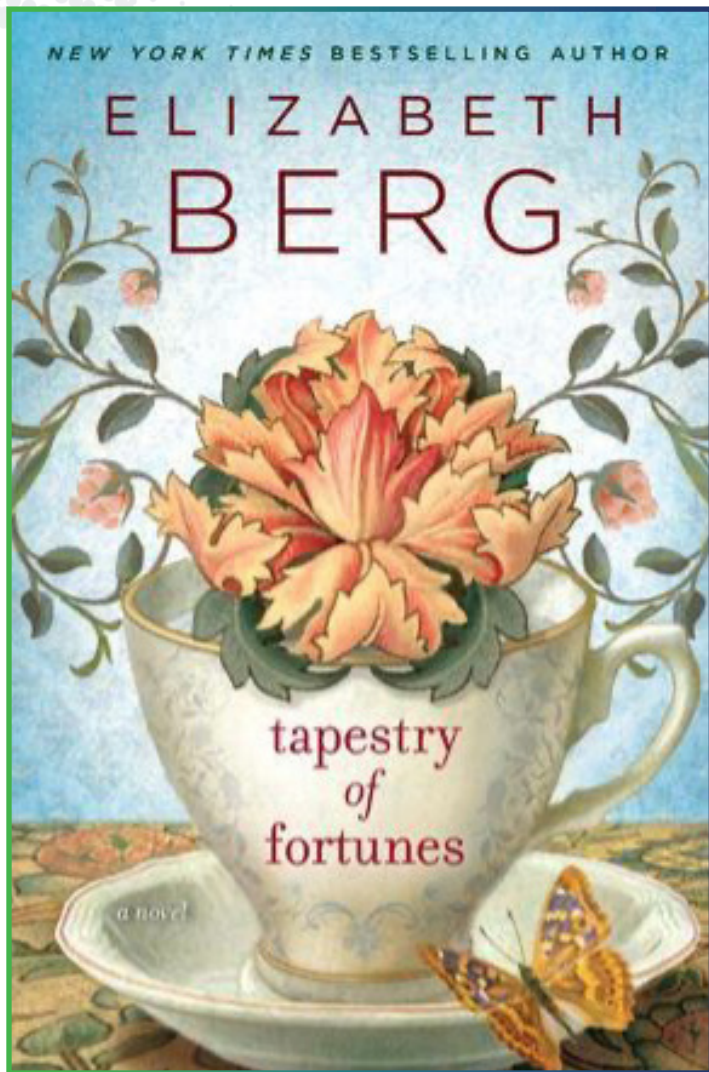
Photo Credit: N4 Solutions

"There were people who knew about what [engineering knowledge] they had, but not what other people had, and nobody knew about the totality of what is available," explained Dixon. "So, working in partnership with the Chief Knowledge Officer, we started building a database of Goddard knowledge called the Goddard Knowledge Exchange. The point of the exchange is: if you don't know about it, or if you can't find it, then the information is of no value."

With Goddard now back open since May 15, Dixon wanted people to know, the Center located at Building 21, is also open and still maintains all of its library service. The assitive and effective staff of 14 librarians, archivists, and technicians are dedicated to fulfilling the information demands of the entire Goddard community.

"We do our best to make it easy for people to have access to resources by making them available electronically," said Dixon. "We are also still here to help with in-depth searching and help with doing different types of projects where they need citation or bibliographic analysis. We are small but mighty."

THE LITERARY X-CHANGE BOOK OF THE MONTH



*In this superb new novel by the beloved author of *Open House*, *Home Safe*, and *The Last Time I Saw You*, four women venture into their pasts to shape their futures, fates, and fortunes.*

Cecilia Ross is a motivational speaker who encourages others to change their lives for the better. Why can't she take her own advice? Still reeling from the death of her best friend, and freshly aware of the need to live more fully now, Cece realizes that she must make a move—all the portentous signs seem to point in that direction.

She downsizes her life, sells her suburban Minnesota home, and lets go of many of her possessions. She moves into a beautiful old house in Saint Paul, complete with a garden, chef's kitchen, and three housemates: Lise, the home's owner, and a divorced mother at odds with her twenty-year-old daughter; Joni, a top-notch sous chef at a first-rate restaurant with a grade A jerk of a boss; and Renie, the youngest and most mercurial of the group, who is trying to rectify a teenage mistake. These women embark on a journey together to connect with parts of themselves long denied.

(Publisher's Summary)

WHAT IS THE LITERARY X-CHANGE?

In 2021, the Strategic Partnerships Office launched a community library with a little help from Tor Books. Goddard has partnered for years with Tor, a leading publisher of science fiction, by connecting them with subject matter experts to promote the science in "science fiction." Located in the lobby of Building 22, The Literary X-Change is available to the entire Goddard community. Here's how it works:

TAKE ONE

If a book strikes your fancy take it. Read it, enjoy it, and—when you're done—share it with a friend or bring it back to the X-Change.

GIVE ONE

Everyone can pitch in to keep the library stocked. Bring books you'd like to share with the Goddard community when you can and continue being a friend of The Literary X-Change!